tho placenta had degenerated into a substance resembling cartilage, of a grayish-white colnur; on the uterine surface it was still spongy and porous in several spots. In Feb. 1846, the samo woman was again arrived near the time of her delivery. She stated that a month previously she had had a slight attack of fever, afier which she was seized with severe pain in the right side of the belly, in which part she felt as if there were a weighty stone lying within her; at the same time she suffered from thirst, sleeplessness, headache, and loss of appetite. Subsequently she was trnubled at various times with bloody, watery, and purulent discharges from the vagina.

On tho 26th Feb., the pulsation of the fœtal heart could not be heard, nor could any movements of the child be felt by the mother or her medical attendant: and at the same time she complained of nausea and a sensation of cold in the belly. Some days afier, she was delivered very quickly of a child which appeared to have been long dead. The placenta was circular, curled inwards at the edges, grayish-yellow in colour. On the fœtal surface it was dark brown nr almost black; and it was so indurated as not to bend when held out by one point.—*Ibid.*, from *Schmid's Jahrbucher*, 1847.

ANÆSTHETIC AGENTS.

[Anæsthetic agents have now been used very extensively in surgical operations and midwifery practice, as also in several morbid conditions of the nervnus system. It would be impossible for us to notice all the cases in which they have been emplnyed, reported in the varinus medical journals;—it will be sufficient to state, that they have been resorted to in almost every description of surgical operation, and in perhaps all the varieties of labour.

We have before us a note from Mr. Lawrence to our esteemed colleague, Professor Warren, of Boston, in which that distingnished surgeon states, that ether inhalation has been used in St. Bartholomew's Hospital, in all descriptions of operative proceedings, from the slightest to the most serious, between two and three thousand times, without a single unpleasant result.

Under these circumstances, we conceive that we shall best subserve the interests of our science and of humanity, by confining nur notices principally to the facts which have been brought forward illustrative nf the physiological action of these agents, and of the cases in which injurions nr fatal consequences have resulted from their use, in order to elucidate, as far as possible, the conditions which forbid their use, and to inculcate more caution than has hitherto been observed in the employment of these very powerful articles.]

43. *Physiological Action of Chloroform and Ether on Animals*.—M. Grubv, in a communication to the Academy of Sciences, announces that the effects of chloroform vapour on dogs and rabbits are as follows:—"1. That during inspiration the arterial blood retains its florid colour, and if, under asphyxia, it assumes the dark venous character, the red colnur is speedily restnred. 2. That a part of the animal, a limb for example, separated from the bndy, and exposed to chloroform or ether vapour, becomes insensible. 3. That if the member be remnved from the vapour, sensibility is restored. 4. That during the inspiration of chloroform vapour, the number of respirations increases with the degree nf insensibility produced. 5. That animals may be kept in a state of insensibility for several hours, and afterwards restored, if the inspiration of the vapour be occasionally interrupted. 6. That on the nther hand, rabbits, dngs, and frngs, die suddenly in from one to fnur minutes afier respiring the vapour, if the dose of chlornform is from 46 to 60 grains, and the inhalation be uninterrupted."—(*Medical Gazette*, December 24, 1847.)

Mr. Thomas Wakley has performed an extensive series of experiments with chloroform and ether on the lower animals (dogs, cats, rabbits, rats, mice, pigs, hedgehogs, horses, and birds). The chloroform and ether were administered by inhalation. Mr. Wakley's researches show:

1. That there is no impnrtant difference in the effects of chloroform when inhaled by the various animals above enumerated.

2. In fatal experiments with the chloroform, the symptoms were quickreatq hing, muscular weakness, showing itself first, as generally happens, in the hind legs, foaming at the mouth, dilntation of the pupil, and congestion of the conjunctiva. As the experiment advanced, the breathing became slow and laborions, there was complete insensibility and muscular prostration, loss of reflex action (indicated by the absence of winking on irritating the cornea), and, finally, death by asphyxia, the heart's action continning for some minutes after the cessation of the respiration. Death occurred in a period varying from three to eleven or more minutes, according to the strength of the animal, or the amount of chloroform used.

The post-mortem appearances are not mentioned in connection with the experiments; but in a concluding remark, the author states that intense venous congestion was found in the lungs, heart, and great vessels.

3. The symptoms, as well as the post-mortem appearances, enjoin caution in administering the chloroform to individuals labouring under congestion of the lungs, or any disease of the heart, or great vessels, which obstructs the free circulation of the blood. It has yet to be shown whether in such cases we might not obtain the anæsthetic effects without the engorgement of the lungs by the introduction of the vapour into the rectum.

4. The chlorofnrm acts with greater energy in young and weakly; than in old and strong animals. Thus, in experiment 9, a strong dog, though made to inhale three drachms during eleven minutes, recovered readily, while in experiment 12, a weakly puppy, about eight months old, died from the effects of inhaling one drachm during three and a half minutes. This fact is important in a practical point of view, as, undoubtedly, great caution ought to be observed in administering chlnroform to very weak individuals, or in young children, in whom it will probably be found that a much smaller quantity than is usually necessary, will be sufficient to induce the anæsthetic sleep.

5. The animals offered much less resistance to the administration of chloroform than to that of ether; indeed, they even seemed to like the former.—(*Lancet*, January 1, 1848.)

We are still in want of a series of experiments illustrating the action of chlnroform when introduced into the lungs, stomach, rectum, cellular tissue, serous cavities, and blood-vessels. It should be used both in the state of vapour and of liquid. It is in this way alone, that we shall ever be able to arrive at a knowledge of its *modus operandi*.—(*Monthly Journ. and Retrospect of the Med. Sciences*, February, 1848.)

MM. Gerardin and Verrier have communicated to the French Academy an account of some carefully performed experiments on animals with ether and chloroform. In one of these experiments, pieces of sponge containing about 15 grammes of chloroform were placed in the nostrils of a horse, in such a manner as to allow free access of air during respiration. In two minutes the animal tottered on his legs, but retained sensation, and shortly recovered. A fresh quantity of chloroform, amounting also to about 15 grammes, was then employed, and insensibility was thereby eventually induced, but not until after seventeen minutes. The pulse remained quiet and regular, the respiration natural. The most painful operations were performed without the slightest appearance of consciousness. One of the carotid arteries was kept exposed during the experiment, but at no period could there be detected any change in the characters of the contained blood. In four or five minutes the horse recovered, and commenced eating.

The manifest inferiority of ether as an anæsthetic agent was well illustrated in another experiment. Sponges soaked with about 30 grammes of ether were inserted, as in the last experiment, into the nostrils of a young colt. After the consumption of this quantity the supply of ether was continually renewed, until 360 grammes were consumed, and the inhalation had continued for three quarters of an hour. But during the whole of this time no change in the animal ensued beyond a slight variation in the pulse, and some dilatation of the pupils: sensibility continued perfect; and there was no alteration in the characters of the arterial blood.

Another set of experiments were performed for the purpose of ascertaining the comparative effects of chloroform and ether, when inhaled as vapours with a large

quaotity of air, and of the same agents when introduced in the liquid state into the circulation. In the experiments with the vapour of these fluids, the animals were confined in a large wooden box, perforated with apertures, to allow of the free access of air, while the vapour was introduced through a tube communicating with a vessel filled with the fluid, and immersed in a sand-bath. A cat introduced into this apparatus, and subjected to the vapour of ether, in three minutes became attacked with sneezings: in about eight minutes it fell down, and became convulsed; and in eleven minutes was completely insensible. On removing it from the box, and cutting its ears, clear bright blood flowed from them. The insensibility lasted for four minutes and a half. The animal gradually recovered, but continued apparently intoxicated, and unable to stand for a short time afterwards. About 40 grammes of ether were employed. A dog, similarly experimented upon with about 30 grammes of ether, became affected, and fell down comatose in less than two minutes. On being withdrawn from the apparatus, it recovered completely in four minutes. Blood obtained from wounds made during the continuance of the insensibility, had all the characters of ordinary arterial blood.

In one of the experiments performed with the view of ascertaining the effects of ether when introduced directly into the blood, 15 grammes of this fluid was introduced into the jugular vein of a horse. In 30 seconds the animal became dizzy, tottered, and then fell down. In one minute sensation was almost suspended, scarcely any signs of pain being given out on dividing the large plantar nerves. A strong odour of ether was exhaled with the breath. The capillaries contained perfectly bright oxygenated blood. Sensibility gradually returned, and the animal recovered in about six minutes. In an hour afterwards, another 30 grammes of ether were introduced into the jugular vein of the same horse. The preceding phenomena recurred with greater rapidity than before, and the insensibility was complete, and lasted for ten minutes. During the whole of this time the arterial blood underwent no apparent change. In another horse, five grammes of chloroform were introduced into the jugular vein: in fifteen minutes the animal appeared intoxicated, and staggered, having a vacant look, and the pupils considerably dilated. This condition lasted for about a minute, when the animal recovered. In a quarter of an hour afterwards, ten grammes of chloroform were introduced into the jugular of the same horse. In fifteen seconds the same phenomena occurred as before, and the animal now fell down. It moaned, was convulsed, and in one minute anæsthesia was complete: no change was observed in the arterial blood. The state of coma continued for about twelve minutes; then the animal gradually recovered, and began to eat.

From the results of their experiments, MM. Girardin and Verrier deduced that the vapour of ether and chloroform, when they are breathed with a due admixture of atmospheric air, do not act on the respiratory apparatus at all, but only on the nervous centres. They deduce, also, from the three last experiments, that ether and chloroform produce the same effects on the system when injected into the circulatory system, as when respired in the form of vapour: a much less quantity being required in the former than in the latter cases. When the fluids are introduced into the blood, the respiratory function is uninterfered with, nevertheless insensibility is manifested in the same manner as during inhalation, and the arterial blood undergoes no perceptible alteration. In the opinion of MM. Girardin and Verrier, ether and chloroform, therefore, exert a special and direct action upon the organs of sensation, and do not act after the manner of irrespirable gases. If asphyxia ever supervenes, it is only in consequence of deranged nervous action. Cases in which a dark colour of the arterial blood has been observed, are evidently those in which the inhalation has been continued after the production of insensibility, and in which asphyxia has been induced by an excess of the agent employed, or by a want of proper respirable air.

Several other observers, as well as MM. Girardin and Verrier, having doubted the correctness of M. Amussat's opinion, that the arterial blood undergoes any alteration in colour during the inhalation of the vapours of ether and of chloroform, M. Amussat has given an account of the process which he adopts in his experiments. Previous to inhalation, he exposes the blood-vessels and nerves at the upper part of the thigh, notices the difference in colour between the arterial

and venous blood, as perceived through the walls of the vessels, and examines the colour of the arterial blood by opening a small arterial branch near the knee, which he then closes by torsion. During inhalation, he states that a gradual change in hue of arterial blood, as seen through the coats of the arteries to that of the venous blood, may be observed; and when inhalation is carried so far that irritation of the nerves is followed by no muscular contractions, the colour of the arteries and veins is exactly the same, and blood procured from the former has the same dark appearance as that procured from the latter. On suspending the inhalation, the arteries speedily resume their characteristic and distinctive appearance. Large animals, such as dogs, should be employed in this experiment; not frogs, pigeons, or rabbits, whose blood-vessels are too small for the purpose.—*London Med. Gaz.*, Feb. 1848, from *Comptes Rendus*, Dec. 27, 1847.

44. *Physiological Action of Chloroform on Man.*—M. Sedillot has observed, that individuals enfeebled by age or disease, and those of temperate habits, are readily affected, and the insensibility is in them persistent. In strong and healthy individuals, and in those habituated to the use of alcoholic drinks, the anæsthesia is slowly produced, and endures for a short period.—*Month. Journ. and Retrospect*, March, 1848.

45. *Action of Chloroform, Ether and Benzin on the Nervous System.*—Dr. Snow, in a paper read before the Westminster Medical Society, (Jan. 8th,) remarked that the action of chloroform and ether on the nervous system was essentially the same. He divides the effects of ether into five degrees, which may be called degrees of narcotism, instead of etherization, to make the description applicable to other vapours. The immunity from pain did not correspond exactly with the degrees of narcotism of the nervous centres, but was greater as the patient was recovering from the effects of the vapour, than in the corresponding degree, as he was getting under its influence; this was more particularly the case with ether, which he considered had superior anæsthetic effects to chloroform in proportion to the narcotism produced. When ether was inhaled, the patient sometimes completely recovered his mental faculties, whilst the insensibility to the operation continued. This curious phenomenon, he believed had not been explained. He had an hypothesis to offer concerning it in this effect—that it depended on etherization of the nerves of sensation, which continued for some little time, on account of the ether exuding through the coats of the capillaries into the extra vascular lymph of the tissues, and requiring some time to return into the circulation, and escape by the lungs. He had met with this persistence of insensibility to the knife chiefly in young subjects, in whom, connected with the greater activity of nutrition, there was more liquor sanguinis exterior to the vessels. In the brain there was but very little at any period of life. Chloroform probably permeated the coats of the vessels less easily, and he had not met with the symptom in question during its use.

Chloroform certainly possessed the advantage of being less pungent than ether, and was therefore more easily inhaled; it had also one or two other advantages. With respect to its greater rapidity of action, this was not an unalloyed advantage. Ether produced a full chirurgical degree of insensibility in the adult in four minutes on an average; it might be desirable to shorten this period to two minutes, but not to a shorter time; not only in order to afford opportunity for watching its effects, but also on account of a cumulative property in these vapours, hitherto not alluded to. The effect of them sometimes increased for twenty seconds after the inhalation was discontinued, and he thought it desirable to have six times this period, or two minutes, for producing complete insensibility, in order to avoid danger. But chloroform, when administered on a handkerchief or sponge, as recommended by Dr. Simpson, its introducer, sometimes produced complete insensibility in six or seven inspirations, as that gentleman stated. 100 cubic inches of vapour of chloroform contain 128 grs. of the liquid, a quantity he believed more than sufficient to cause death; and yet this quantity might be contained in 700 or 800 cubic inches of air, and might be all breathed in a quarter of a minute, by taking deep inspirations. Danger might, it was true, be probably avoided, by putting but a limited quantity on the handkerchief or sponge, but this

method was not very applicable in surgical operations, as they could not tell how much would evaporate without being inhaled, and consequently, would be liable to fall short of the effect. When he, Dr. Snow, administered chloroform, he seldom produced complete insensibility in less than two minutes, as he never used the water-bath at a higher temperature than 60°, and if the patient breathed deeply, he opened the valve a little to dilute the vapour still further with external air.

He preferred chloroform on the whole to ether in the cases of adults, and had given it to young children with the most satisfactory results, yet he preferred the less powerful agent in the cases of children, as chloroform acted with still greater rapidity on them than on grown people. Ether rendered children insensible to any operation in the space of two minutes, and its effects on them were extremely favourable; but it required an apparatus by which the vapour could be exhibited very gradually at first, otherwise it caused them to hold their breath, as, indeed, did chloroform. He considered that an anæsthetic agent, which could be safely administered on a sponge or handkerchief by medical men, with no special experience, to all patients, young and old, was still a desideratum. He had lately applied benzin in St. George's Hospital, and its action was very efficient and favourable in four cases of tooth-drawing, where its effects were only carried to the second degree; but in an amputation where narcotism to the third degree was induced, it caused some convulsive tremors, and, consequently, although it totally prevented the pain, and was followed by no ill consequences, yet it did not seem applicable to important operations. The benzin he used was prepared by Mr. Bullock, by distilling benzoic acid with slaked lime. About the same quantity as of chloroform was expended, as about a drachm was used in each of the cases of tooth-drawing, and two drachms in the amputation; but being less volatile, it produced its effects less quickly. Benzin was the same liquid, under another name, as the bicarburet of hydrogen which Dr. Faraday had previously discovered and obtained from condensed oil-gas. It consisted of six atoms carbon and three atoms hydrogen, and had a rather pleasant aromatic odour. He placed on the table an apparatus which he had contrived and used for the administration of chloroform. It consisted of two cylinders placed one within the other, and partially lined with bibulous paper, which absorbed the liquid and gave it up again to the air which passed over its surface. These cylinders were enclosed in a third one containing a water-bath. The inhaler was about the size of a half pint bottle, and when in use was suspended by means of a short tube and screws to the face-piece which formed part of his ether apparatus.—*London Med. Gaz.*, Jan. 1848.

46. *Effects of Chloroform on the Blood.*—Mr. T. B. Todd, who amputated the leg of a patient under the influence of chloroform states, (*Prov. Med. and Surg. Journ.*, Feb. 9th, p. 62,) "one circumstance which particularly arrested my attention during the process of securing the vessels, was the highly venous appearance of the blood issuing from the arteries," and I further remarked, "that in proportion as the special effect of the chloroform passed off from the patient, the blood from the small muscular branches resumed its arterial character."

47. *Means of Reviving those Rendered Insensible by Chloroform.*—M. Plouviez has communicated to the French Academy of Sciences, an account of an experiment on a dog with chloroform. A small dog, weighing about eight pounds, was made to inhale a gramme and a half of chloroform. At the expiration of ten or fifteen seconds the animal was in a state of insensibility. The breathing was soon difficult, and in a short time the animal was dead. The time that elapsed between the exhibition of this dose (about the twentieth of an ounce) and death was a minute and a half. On dissection there was nothing to indicate the cause of death. Dr. Plouviez, in order to ascertain what course could be taken in the event of such an accident occurring to a human patient, made several experiments with various animals, which were ceasing to breathe after the use of chloroform. He introduced air into the lungs in the same way as is done with persons, who have been suffocated by the fumes of charcoal, by stimulating the act of respiration, and from time to time slightly compressing the chest. By adopting this means all the animals speedily resumed their former state. In some cases he even waited until the breathing had entirely ceased, and the animals were apparently

dead. In various periods of time from thirty seconds to four minutes, he was able to bring them to life.

M. Blanchet has shown by experiments on animals that oxygen gas introduced into the lungs is efficacious in recovering animals poisoned by chloroform.—(*Comptes Rendus*, 20th Dec., 1847.)

The following means are recommended for adoption in cases where an overdose of chloroform has been taken, by the Editor of the *Month. Journ. and Retrospect of the Med. Sci.*, (March, 1848.) The patient should be laid on the floor, with his head, if possible, near a current of fresh air. The breathing may be assisted by compressing the chest, and a little cold water ought to be thrown on the face and chest. If the symptoms continue notwithstanding these means, artificial respiration should be diligently practised, and the extremities briskly rubbed with hot cloths. The friction promotes the capillary circulation, and in this manner, undoubtedly contributes powerfully to restore the action of the heart and lungs. In extreme cases electro-galvanism should not be neglected; shocks may be transmitted through the chest, so as to assist the efforts at artificial respiration, and in the case of syncope, a powerful galvanic current should be transmitted through the heart. A very powerful and rapid means of rousing the sinking powers of life, and one readily obtained, is found in the application of boiling water to the chest. This is effected by filling a glass or cup with boiling water, over the top of which a towel is placed, and then inverting the vessel on the breast of the patient. The efficacy of this application has been repeatedly displayed in the practice of M. Rayer of Paris. Individuals who, from disease, were so near death as to be completely insensible and speechless, have thus had intelligence and speech restored, while life was prolonged for a considerable time. Of course, it is understood that we only suggest its use in extreme cases. Dr. Simpson directs attention to the impropriety of administering stimulant liquids by the mouth, when, from the state of insensibility, the power of swallowing is lost. The danger of their covering the aperture of the glottis, or entering the larynx, and so hastening death by suffocation, is indeed imminent. When the saliva is secreted in large quantity, it will be advisable to place the patient on his side, to prevent it acting injuriously in the same way. The loss of the stimulants is scarcely to be regretted, as the other means above proposed are infinitely more efficacious.

The procedure here indicated is equally applicable, whatever view may be entertained as to the immediate cause or mode of death. This point is not yet satisfactorily determined. As with other cerebro-spinants, the death seems to be of a mixed kind, partaking both of the characters of asphyxia and syncope, the one or other predominating according to the dose, mode of exhibition, idiosyncrasy, &c. Experiment has shown that, when a small proportion of air is inhaled with the chloroform, asphyxia plays a prominent part in the symptoms.

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48. *Opinion of M. Roux relative to the use of Ether Inhalation.*—The *Gazette des Hôpitaux*, (Nov. 11 and 16,) contains an interesting lecture on this subject, by M. Roux, delivered at the opening of his clinical course for the session 1847–48. The lecturer considers pain in three points of view:—

1*st*. As a symptom in many diseases, in which it constitutes a valuable element of diagnosis, and in which it serves as a characteristic phenomenon.

2*d*. As inseparable from surgical operations.

3*d*. As a therapeutic means capable of producing a favourable modification of the diseased organism.

In treating of pain as inseparable from surgical operations, the distinguished surgeon thus notices etherization:

"We no longer resort to etherization as we thought it our duty to do when it was first discovered. Then it seemed necessary that we should hasten to see its effects; we had to multiply cases,—we took advantage of all cases which offered themselves to us. Now that thousands of facts have been collected, we see that ether should be *only* used for serious operations, where pain is very much dreaded."

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49. *M. Blandin's opinion of Etherization.*—M. Blandin, in a clinical lecture, (*Gaz. des Hôp.*, Nov. 23,) remarked: "Like all active medicaments ether, with

its advantages, has its evils. We know now, no less than twelve persons who have succumbed to etherization, and these deaths are well authenticated—unhappily, they cannot be doubted."

50. *Comparative advantages of Ether and Chloroform.*—According to M. Sedillot, (*Proceedings of Acad. of Sci.*, Jan. 10,) the advantages possessed by chloroform over ether are compensated by dangers which should be pointed out to the profession. Thus, when, for instance, anæsthesia has been produced by ether, if the inhalation be suspended, insensibility may continue for some time, but does not become more complete; on the contrary, with chloroform, the pallor, smallness of the pulse, weakness of respiration, and coldness of the skin sometimes increase, after the inhaler has been removed, in an alarming manner. Twice M. Sédillot seriously feared the consequences of this incessant annihilation of the vital functions. Therefore, the professor of Strasbourg thinks it advisable that the surgeon be not guided, as in the administration of the vapour of ether, by the state of the respiration, but that he should suspend the inhalation of chloroform when muscular relaxation has taken place.—*Med. Times*, Jan. 22, 1848.

51. *Injurious Effects from Chloroform.*—Mr. Beales, of Suffolk, relates (*London Med. Gaz.*, Dec. 24th) the case of a young lady, 27 years of age, in whom chloroform inhalation produced asphyxia and convulsions, and he states that he witnessed an operation for stone, in which violent convulsive action of the extremities was occasioned by chloroform inhalation.

Mr. R. Stewart relates, in the *London Med. Gaz.*, (Jan., 1848,) a case of a young lady to whom he administered chloroform preparatory to the extraction of a tooth. In two minutes slight convulsive twitchings of the muscles of the face occurred, to these violent convulsions of the whole body supervened, accompanied with loud cries and sobbings: the pulse was 80, full and hard; the pupils slightly contracted, and the jaws firmly clenched together. She continued convulsed for at least ten minutes, and then became tranquil, and sank back for an instant in her chair. She then gave way to a few hysterical sobs, and soon recovered.

At a recent meeting of the Surgical Society of Ireland, Mr. Stapleton stated that he had lately tried chloroform in some cases in Jervis Street Hospital. One man was put into a sound sleep, but awoke in about a minute afterwards, and expressed himself as having been conscious of everything that was done to him; while apparently unconscious, he said that he had felt himself pinched, and so forth; but was unable to resist or give any indication of feeling. A resident pupil of the hospital had tried it a day or two ago, and was very merry during its action; to-day he again tried it, and was put to sleep in two minutes, but recovered in two minutes more, and shortly after began laughing in a hysterical manner, and soon fell into violent convulsions, so as to require the united efforts of several people to hold him down in bed; he then got rigors, cold perspirations, and sickness of the stomach; his pulse sometimes fell very low, and, when the excitement was coming on, it would rise to 100. He remained in this uncertain state for two hours, and then expressed a wish to sleep. Under the operation of the chloroform there was a complete loss of muscular power, except during the convulsions.—*Dublin Medical Press.*

Mr. Wm. W. Gull relates in the *Lond. Med. Gaz.*, (Dec. 1847,) the case of a boy, æt. 11, under the care of Mr. Cock at Guy's Hospital, for disease of the knee-joint, and for which it was determined to divide the tendons of the flexors. The boy was in good health, but his nervous system a little weakened from confinement to bed; his heart and lungs sound. A small quantity of chloroform, not exceeding thirty drops, was put upon a cone of bibulous paper, and placed over his mouth and nose. In less than a minute he was entirely insensible, the pupils becoming widely dilated, and the pulse small and frequent. As the operation was being proceeded with, his consciousness partly returned, and a few drops of the chloroform were put on a handkerchief and applied to the nose. He was instantly affected, and to such a degree that there was the greatest apprehension of his never rallying; the pulse was very feeble, 56; the breathing so indistinct as scarcely to be distinguished; the face pale, lips congested; the symptoms of collapse extreme. Ammonia was employed, and, after about five mi-

nutes, he gave two or three deep inspirations: it was however, more than fifteen minutes before he was so far himself as to be considered out of danger. Subsequently a small quantity of brandy was administered. He complained of headache. For a long time after he recovered his special senses and power of motion, general and perfect anæsthesia of this surface existed. The boy subsequently entirely recovered.

52. *Pneumonia Coming on after Inhalation of Ether.*—At a meeting of the Medico-Chirurgical Soc. of Edin., May, 1847, Dr. Bennett mentinned the follnwing ease of pneumonia coming on after ether inhalation. "A gentleman had been confined for a fortnight with inflamed glands in the groin, which suppurated. He was anxious to have the ether before they were npened, which was given, and produced its full effects in three minutes. The ether employed was of the greatest purity, and had been manufactured for the purpose of inhalation. Dr. Simpson's instrumeot was used. The patient afterwards stated that he had felt the abscess opened, although there are some grounds for doubting the accnracy of the statement. He experienced the most pleasant sensations, and described himself as being in elysium for some time even after consciousness had returned. In a few hours great mental depression supervened. After ten hours there was a distinct rigor, followed by high fever, with mental hallucination. Next day all the symptoms and signs of pneumonia were made manifest, and there was subsequently dullness on percussion, crepitating rale on the right side inferiorly, slight enough, with rusty coloured sputa. He recovered under the usual remedies. This gentleman had been in bed for a fortnight; he lived in a warm room. There had been no exposure to cold, or indeed any other appreciable cause, except the inhalation of ether.—*Lond. and Edin. Month. Journ.* for June, 1847.

53. *Injurious Effects from Inhalation of Ether.*—Mr. Eastmart has published the case of a boy, who had compound fracture of the left thigh. Amputation was performed when he was under the influence of ether. With the conclusion nf the operation the difficulties and anxieties nf the case commenced, for the patient was in such a state of exhaustinn and intoxication, that his life became endangered, and he died three hours subsequently. The state of the brain during this period was peculiarly distressing. There were alternate manifestations of excitement and depression of the sensorial powers; at one time resembling delirium, at another like approaching syncope, and again, like violent intoxication.—*Ibid.*

54. *Death from Ether Inhalation.*—M. Piedagnel reported to the Medical Society of Emulation, June 2, 1847, the following case, in which he did not hesitate to attribute the death of the patient to the inhalation of ether.

A patient was admitted into M. P.'s wards with a slight cough and uneasiness. One of the residents made him respire the vapour of ether on three consecutive days, without producing insensibility, as he proposed to extract a tooth. The first day the inspiration was continued for twenty minutes, the second, thirty minutes. Finally the patient determined to have the tooth extracted without etherization. He was afterwards attacked with loquacious delirium and died. Autopsy showed that he had intense arachnitis. M. P. is convinced that the ether was the cause nf this inflammation. In answer to a question, M. P. stated that the etherization was made under his own eyes, and with an approved valvular apparatus.

55. *Death Produced by Chloroform.*—Dr. T. N. Meggison relates (*Med. Times*, Feb. 5th, 1848,) the following case in which death resulted from the inhalation of chloroform.

"The patient, a fine grown girl of fifteen, had been suffering for some time past from onychia of the left great toe, the matrix appearing involved extensively. After consulting with Mr. Lloyd, my assistant, we deemed it absolutely necessary that the nail and matrix should be completely removed. I ought to say that about a year previously, the nail of the other great toe had been removed at the Newcastle Infirmary; but, the matrix having been left, the disease had spread, and indueed neerosis of the distal phalanges of the toe, rendering amputation necessary, the propriety of which we merely urged, thinking to do it after the operation had been performed on the other foot.

"During the previous operation she was under the influence of ether, and said she felt no pain nor inconvenience from it except a severe headache afterwards, and great uneasiness during the inhalation, from irritation of the fauces. We assured her she would feel none of that irritation from the use of chloroform, and that in the cases in which I had used it the headache, if any, had been transient. The whole of the day previous to the operation she had been fretting much, and apparently dreading it, crying continually, and wishing she were dead rather than submit to it. In this state we found her on Friday last, at noon, when we went to perform the operation. We endeavoured to console her, and calm her fears, assuring her she would not feel it, and urging her to be more collected, but in vain. She sat down in the chair sobbing. I poured a teaspoonful of chloroform on a handkerchief, and, on applying it, she drew her breath twice, and pulled my hand down. I asked her to put her hands on her knees, which she did, and breathed quietly for about half a minute, when, no stertorous breathing or change of appearance supervening, I lifted her hand, and, finding it rigid, requested Mr. Lloyd to remove the nail and matrix. This was dexterously done with one sweep, at the termination of which she kicked out, and I, thinking the chloroform not sufficiently potent, was proceeding to apply more to the handkerchief, when her lips, which had been previously of a good colour, became suddenly blanched, and she spluttered slightly at the mouth as one in epilepsy. I threw down the handkerchief, and gave her cold water immediately, followed by brandy. This, however, had not the least effect, not the slightest attempt at rallying being made, and in a minute more she ceased to breathe. A vein in the arm was opened, as also the jugular, but no blood would flow. The whole process of inhalation, operation, bleeding, and death, could not, I should say, have occupied two minutes."

At an inquest the following testimony was given by Sir John Fife:— "I am a surgeon in Newcastle-upon-Tyne. I made a *post-mortem* examination of the body of Hannah Greener, the deceased, along with Dr. Glover, about three o'clock in the afternoon of Saturday last. The body was that of a well-grown girl, of the age indicated. The legs were rather thin; calves not sufficiently fleshy; breasts tolerably well developed, and, on the whole, thin. She was not devoid of fat, as appeared on proceeding to open the body. The body was perfectly free from spots or stains of any kind, except from the marks of phlebotomy, to which she had been subjected, and some slight livid stains about the neck. The toes showed the nature of the operations which had been performed. There was simply the ordinary degree of rigidity. The mouth was a little open. The eyes presented no appearance of congestion. On opening the chest the lungs were not collapsed. One or two slight adhesions were encountered on separating them from the walls of the chest. The external appearance of both lungs, over the whole surface, but especially in the inferior portions, was that of organs in a very high state of congestion. They were mottled with patches of a deep purple, bluish, or scarlet hue. They were everywhere crepitant. Along the outer and anterior border of both lungs, particularly of the upper lobe of the left lung, were several emphysematous bubbles of small size. On cutting into the pulmonary tissue, it was found free from tubercles, unless some hard bodies about the roots of the bronchia, enlarged and partially indurated glands, could be so called. The pulmonary tissue was filled with bloody froth, which was also found in the interior of the bronchia mixed with mucus. There was no appearance of hepatization. On examining the larynx and trachea, the epiglottis was found reddened at the summit, of a vermilion hue. The mucous membrane of the larynx was redder than natural, mottled with vascular patches. The sinuses of the larynx contained a good deal of dark mucus. The œsophagus was healthy. The stomach was distended with food. Digestion had been going on at the time of death. The liver, kidneys, and spleen were more congested than usual. The heart contained dark fluid blood in both its cavities; very little in the left; its structure, and that of the great vessels near it, was healthy. The brain, externally and internally, was more congested than usual, and the ventricles contained rather more than the usual quantity of serum. In my opinion the cause of death was the congestion of the lungs, and that congestion I ascribe to the inhalation of chloroform. Of the power of chloroform to occasion such congestion no doubt can be entertained after the experiments of Mr. Wakley and Dr. Glover on animals. There does not seem to have been

anything in the previous condition of the young woman to have prevented the surgeon from having recourse to chloroform as a means of allaying pain, in one of the most painful operations of surgery. Such is my opinion of the effect of chloroform in lessening human suffering, and the small degree of danger attending its application in the cases that I have seen, that if I were myself required to undergo an operation I would have no hesitation whatever in taking it. I have been using chloroform three or four times a week ever since its efficacy in relieving pain was published, and I have never seen bad effects from it. In one instance, that of a woman, who had to submit to the removal of a tumour, weighing about three pounds, and distributed over a surface about a foot square, Dr. Glover and I administered about eight times the quantity of chloroform that was used in the case of the deceased. She recovered quickly, and was not worse after the operation than might have been expected from its formidable character. I have used it frequently in amputation, lithotomy, and a great many severe surgical operations, and never knew any bad consequence arise from it. I attribute the fatal effect of the chloroform in the present instance to peculiarity in the constitution of the young woman. I am doubtful whether it arose from the state of the lungs, or the peculiar susceptibility of the nervous system. No effect could arise in the present instance from the ether she took on the 26th of October in the infirmary. I have no hesitation in affirming that the fatal issue of this case might have occurred in the hands of the most prudent and skilful surgeon that ever lived. It sometimes happens that a person will die from the shock of the operation, within a very few minutes after, and with nothing to show the cause—merely from the shock it gives the system. Those cases are rare. I think in such cases the same individuals would be influenced in a similar way with chloroform. The same susceptibility of nerve that would render the shock fatal would render the chloroform fatal. No human foresight, no human knowledge, no degree of science could have forewarned any man against the use of chloroform in this case. I have refused to apply it in some cases where the operation could be done in a moment, and was not attended with severe pain; but in every painful case I use it, and, unless it produced insensibility, I would go on repeating it to double the quantity used in this case, and more, if it were necessary. A case occurred lately in the infirmary where a great deal of blood flowed during the operation, which was a very tedious one; and chloroform was repeated during the operation without any bad result afterwards."

56. *Fatal result from inhalation of Chloroform.*—Dr. Robert Jamieson relates (*London Med. Gaz.*, 26th Feb., 1848) a case of death from inhalation of chloroform. The subject of it was a lad, æt. 19, apprentice to a druggist, who had been in the habit of inspiring the vapour of chloroform for the sake of the pleasureable sensations which he found it created. On the 8th of Feb. "he had been observed when weighing out an ounce of chloroform to order, to be holding his handkerchief to his mouth, and to become soon after somewhat excited. There was only a boy with him in the warehouse at the time, and as he had known him to become violent when interfered with on such occasions for the purpose of taking the chloroform bottle from him, he was not displeased when he saw him proceed to a retired part of the shop, where, leaning his body forward on a counter, and stooping his head, he seemed to be inhaling the vapour from some folds of his apron, which he had applied to his mouth and nostrils. Some person connected with the establishment came in at the time, and seeing him in this position, and apparently snoring, tapped him on the shoulder, and said 'What are you doing asleep at this time of the day?' Receiving no answer, the boy in the shop told this person that Walker had been again at the chloroform; on which they determined, as had been formerly their custom, to send for his father to take it from him, as on such occasions they had found that no other authority had any control over him. No one went near him until about twenty minutes after this, when his father arrived, and he, on lifting him up from the counter on which his body was bent forwards, found him to all appearance lifeless."

In his remarks on this case Dr. Jamieson says:—"The quantity of chloroform inspired in this instance could not be accurately ascertained, but was supposed, from the fluid left in the bottle out of which it had been taken, to have been about

three or four drachms. He had frequently been in the custom of inhaling it, and that very day had repeatedly been inspiring small quantities of it by holding his nostrils over the mouth of the bottle. That asphyxia was the proximate cause of death, the history of the case, and the post-mortem appearances, leave no room for doubt. That the asphyxia was consequent upon the inhalation of chloroform seems also evident from the history of the case, the post-mortem appearances, and the results of the examination of the blood; though at the same time it is probable that the fatal issue may have been facilitated by the unfavourable position in which the body was placed when the insensibility was induced, and possibly also by the morbid conditions which existed within the chest. Not having seen the body until some time after it had been raised up from the counter, I examined those who saw him lifted up, and from the account furnished by them, though his mouth and nostrils were lying upon the folds of his apron, upon the hard board before him, they did not consider his position sufficient to account for suffocation."

[Another case of death from inhalation of chloroform will be found noticed in our Domestic Summary, p. 572.]

57. *Ether in Tetanus.*—Mr. Hopgood relates (*Med. Times*, Jan. 15th) a case of tetanus, in a boy nine years of age, resulting from an incised wound on one of his knuckles, successfully treated by the inhalation of ether.

M. Velpeau employed chloroform in a case of traumatic tetanus in a man thirty years of age, admitted into La Charité. The spasms were arrested whilst the patient was under the influence of the article, but a fatal result was not prevented.

58. *Chloroform in Typhus Fever.*—(*Lancet*, January 29.) Dr. Fairbrother has employed chloroform in a bad case of typhus fever, to produce a sedative effect. The patient was delirious, the system worn out for want of sleep, and life was despaired of. The soporific state was induced in a few seconds, and continued for half an hour. It was several times subsequently repeated, at intervals, and with very satisfactory results. The patient recovered.

59. *On the Application of Ether in Midwifery.*—Dr. Roux, of Toulon, who has closely investigated the subject, has come to the following, among other conclusions, respecting the use of ether in midwifery.

1. No injury is done to females in the puerperal state by the respiration of ether vapour.

2. That in ordinary deliveries, ether vapour, by suppressing pain, does not interfere with labour.

3. That in difficult labours it is desirable, both for the mother and child, to prevent suffering.

4. The uterus and abdominal muscles continue to contract when the female is under the influence of ether.

5. The child does not appear to participate in the stupefaction produced by ether.

6. The various changes following delivery are not impeded or aggravated—thus the hemorrhage is not increased, and the milk is equally secreted.—*London Med. Gaz.*, October, 1847, from *Gaz. Méd.*, October 9.

60. *Use of Chloroform in Natural Labour.*—Dr. Samuel Ashwell, late Obstetric Physician and Lecturer in Guy's Hospital, in a letter to the editor of the *Lancet*, (March 11, 1848,) condemns the use of chloroform in natural labour. He asks: "Why is this great risk to be run? It is not pretended that it shortens the duration of the process; nay, if anything be attributed to chloroform on this head, it is almost certain that delay must be the consequence of its exhibition. There is no evidence to show that any *favourable* effect, save the unconsciousness of pain, can be traced to its influence.

"I do not deny that physical pain is an evil; but before we attempt to abolish this hitherto invaluable accompaniment of natural labour, it is incumbent on the advocates of the use of chloroform to prove to demonstration that this interference is entirely safe. A careful perusal of one of the able and admirable lectures of

Dr. Tyler Smith (vide *The Lancet*, March 27, 1847) will satisfy any impartial inquirer that obstetric etherization is, at least, of very doubtful benefit, and of very complicated and uncertain operation."

He quotes some remarks of Baron Dubois (see Number of this Journal for October, 1847, p. 521), and of Mr. Tyler Smith, and then observes:

"These facts, and three deaths at least from the new agent, chloroform, besides many other serious results, will probably satisfy most practitioners that 'a meddlesome midwifery' is still a bad midwifery.

"In common with most teachers, I have long inculcated at Guy's Hospital, 'that unnecessary interference with the provideotially arranged process of healthy labour is sure, sooner or later, to be followed by injurious and fatal consequences.'

"I think the chloroform will be no exception to these precepts; nay, so sure am I that it needs only to be extensively used to insure its entire abandonment, that I would willingly leave it to such a result, if it might be accomplished without further loss of life. But the instances in which it has already proved fatal, although they will alarm, may not so quickly, as is to be desired, lead to its final relinquishment. It is, therefore, a duty to urge every just plea against its further use.

"I forbear," he further says, "to enter into the question—whether there be any form of labour in which chloroform should be used?—further than to say, in instrumental and flooding cases, we rely as a considerable evidence of the safety of the patient, and of the uninjured state of the womb and adjacent parts, on that very pain which it is the purpose of the gas to destroy. Whether in the very difficult cases of turning, where the womb is most firmly and tonically contracted round the child, it might be of use, I am not prepared to say. I fear, however, it would produce but little benefit. Lately, at Enfield, I was consulted in a case of rigid perinæum, where the chloroform was fully exhibited, under the impression that it might induce relaxation. No such result followed. Dr. Millar, with great promptitude, applied twenty leeches to the part, and the child was eventually born dead. If there was any effect produced here, it was to weaken the uterine effort, but whether the chloroform produced the death of the child, I cannot say."

61. *Delirium caused by Inhalation of Chloroform.*—Dr. Mitchell, of Dublin, relates a case in which he administered chloroform to a patient in labour, with the effect of rendering her violently delirious.—*Lond. Med. Gaz.*, Jan. 1848, from *Dub. Med. Press.*

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62. *Recovery from a poisonous dose of Strychnia.*—Dr. Thomas Anderson records, in the *Monthly Journal and Retrospect of the Medical Sciences*, a case in which seven grains of strychnia were taken without producing fatal consequences. The subject of the case was a gentleman who had long suffered from severe tic douloureux, for the relief of which he was in the habit of taking muriate of morphia, in increased doses, until three and a half grains were necessary to produce its effect. Having occasion to go a short distance in the country on business, he took, previous to setting out, his usual dose, 3½ grains of strychnine, given him by an apothecary by mistake for muriate of morphia, which he placed on his tongue and swallowed;—he remarked at the time that it was extremely bitter, and that the taste was more than usually persistent, but it did not occur to him that anything was wrong. Shortly after, however, while walking along the street, he felt slightly indisposed, the most prominent symptom being a sense of numbness in the back of the legs, which he attributed to the effects of cold, to which he had been exposed in the early part of the morning. As these symptoms did not appear of any importance, he proceeded by a public conveyance to the village where his business lay, and returned by the next opportunity. During the whole of this time the symptoms remained precisely as they were the moment he first observed them; but as he was walking along, on his return, they suddenly increased, the numbness being accompanied by a sense of want of power, and a sort of drag-